DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/5/2008 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka et al. (US Patent No. 5,760,832) in view of Ogura et al. (US Application Publication No. 2002/0020845), and further in view of Hashimoto (US Patent No. 5,018,006).

Regarding **claim 1**, Yamanaka et al. disclose an imaging device (1) comprising at least two image capturing apparatus, i.e. a CCD that senses red and blue components (19) and two CCDs that sense green component (17, 18), each apparatus being arranged to produce an image, i.e. a R/B photo image and G1/G2 photo images

(see col. 6, lines 58-67), wherein at least one first apparatus comprises a color filter matrix of red and blue elements, i.e. a sensor matrix of red and blue pixels (see figure 6), and at least one second apparatus comprises a green color filter, i.e. a sensor matrix of green pixels (see figure 5). It would be inherent to use a controller, i.e. a microprocessor, in order to form a full-color enhanced image by combining the images produced with each apparatus (see col. 13, lines 9-20). Yamanaka et al., however, do not disclose that each apparatus includes a respective lens for producing an image.

On the other hand, the use of a planar layout for multiple image capturing apparatuses including a focusing lens for each apparatus is old and well known in the art, as evidenced by Ogura et al. (see figures 1 and 11).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a well-known planar layout including a lens for each of the image capturing apparatuses disclosed by Yamanaka et al. because the overall size of the image pickup device is minimized since the use of a bulky prism is eliminated and the image capturing apparatuses are manufactured on the same substrate.

In addition, Yamanaka et al. in view of Ogura et al. do not disclose that a sensor corresponding to the second apparatus comprising a green filter has pixels that are smaller than the pixels corresponding to the sensor of the first apparatus. Hashimoto, on the other hand, discloses a sensor having a green filter wherein the pixels are smaller than the pixels corresponding to a sensor having a color filter comprising red and blue elements (see figure 28).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to implement, in the second apparatus of Yamanaka et al., a sensor having pixels which are smaller than the pixels corresponding to the sensor of the first apparatus taught by Yamanaka et al. because having different sizes of pixels enables "the sensitivities of image pickup devices to be optimized both for luminance and for colors" (see Hashimoto, col. 5, lines 62-66).

Regarding **claim 2**, Yamanaka et al., as modified by Ogura et al. and Hashimoto, disclose a controller, i.e. a control unit (20), arranged to produce a single color image from the image taken with the second apparatus, i.e. G1/G2 photo images (see Yamanaka et al., col. 6, lines 58-67).

Regarding **claim 3**, Yamanaka et al., as modified by Ogura et al. and Hashimoto, disclose that the second apparatus comprises a color filter matrix of green elements, i.e. a sensor matrix of green pixels (see Yamanaka et al., figure 5).

Method **claims 8-10** are drawn to the method of using the corresponding apparatus claimed in claims 1-2. Therefore method claims 8-10 correspond to apparatus claims 1-2 and are rejected for the same reasons of obviousness as used above.

Claims 4-7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. (US Application Publication No. 2002/0020845), and further in view of Hashimoto (US Patent No. 5,018,006).

Regarding **claim 4**, Ogura et al. disclose a lenslet array, i.e. small lenses disposed in the same plane (see elements 46 in figure 9), with at least three image capturing apparatus i.e. red, blue and green color picture cell arrays (2, 3, 5) with their respective color filters (see paragraph [0052] and [0087]), each apparatus including a single lens (6, 7, 9) and each apparatus being arranged to produce an image, wherein a first apparatus comprises a red color filter, a second apparatus comprises a blue color filter, and a third apparatus comprises a green color filter (see paragraph [0052] and [0087]), each apparatus comprising an image sensor, i.e. red, blue and green color picture cell arrays (2, 3, 5). It would be inherent to use a controller, i.e. a microprocessor, in order to form a full-color enhanced image by combining the images produced with each apparatus.

Ogura et al., however, do not explicitly disclose that the pixels of the image sensor of the third apparatus, interpreted as green color picture cell array 3 in figure 10A with its respective color filter, are smaller than pixels of the image sensors of the first and second apparatus, interpreted as red color picture cell array 2 and blue color picture cell array 5 each with their respective color filters.

Hashimoto, on the other hand, discloses a sensor having a green filter wherein the pixels are smaller than the pixels corresponding to a sensor having a color filter comprising red and blue elements of the same size (see figure 28).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to implement, in the third apparatus of Yamanaka et al., a sensor having pixels which are smaller than the pixels corresponding to the sensors of the first and second apparatuses taught by Yamanaka et al. because having different sizes of pixels enables "the sensitivities of image pickup devices to be optimized both for luminance and for colors" (see Hashimoto, col. 5, lines 62-66).

Regarding **claim 5**, Ogura et al. as modified by Hashimoto discloses that the pixels of the image sensor of the third apparatus are at least half as large as pixels of the image sensors of the first and second apparatus, i.e. the green pixels are half as large as red or blue pixels (see Hashimoto, figure 28).

Regarding **claim 6**, Ogura et al. disclose a lenslet array, i.e. small lenses disposed in the same plane (see elements 46 in figure 9), with at least three image capturing apparatus of the same size, i.e. red, blue and green color picture cell arrays (2, 3, 5) with their respective color filters (see paragraph [0052] and [0087]), each apparatus including a single lens (6, 7, 9) and each apparatus being arranged to produce an image, wherein a first apparatus comprises a red color filter, a second apparatus comprises a blue color filter, and a third apparatus comprises a green color filter (see paragraph [0052] and [0087]), each apparatus comprising an image sensor, i.e. red, blue and green color picture cell arrays (2, 3, 5). It would be inherent to use a

controller, i.e. a microprocessor, in order to form a full-color enhanced image by combining the images produced with each apparatus.

Ogura et al., however, do not explicitly disclose that the number of pixels of the image sensor of the third apparatus, interpreted as green color picture cell array 3 in figure 10A with its respective color filter, is larger than the number of pixels of the image sensors of the first and second apparatus, interpreted as red color picture cell array 2 and blue color picture cell array 5 each with their respective color filters.

Hashimoto, on the other hand, discloses a sensor having a green filter wherein the number of pixels is larger than the number of pixels corresponding to a sensor having a color filter comprising red and blue elements of the same size, i.e. the green pixels are smaller than the red or blue pixels and the sensors have the same size (see figure 28).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to implement, in the third apparatus of Yamanaka et al., a sensor having pixels which are smaller than the pixels corresponding to the sensors of the first and second apparatuses taught by Yamanaka et al. because having different sizes of pixels enables "the sensitivities of image pickup devices to be optimized both for luminance and for colors" (see Hashimoto, col. 5, lines 62-66).

Regarding **claim 7**, Ogura et al. as modified by Hashimoto discloses that the number of pixels of the image sensor of the third apparatus is at least twice as large as the number of pixels of the image sensors of the first and second apparatus, i.e. the

number of green pixels is double the number of red or blue pixels (see Hashimoto, figure 28).

Method **claim 11** is drawn to the method of using the corresponding apparatus claimed in claim 4. Therefore method claim 11 corresponds to apparatus claim 4 and is rejected for the same reasons of obviousness as used above.

Response to Arguments

Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Tse (US Patent No. 5,477,345) discloses a three color sensor array wherein the green pixels are smaller than the blue and the red pixels.
- Tandon et al. (US Patent No. 6,961,157) disclose an imaging apparatus wherein green pixels are smaller than red and blue pixels.
- Spears et al. (US Patent No. 7,027,193 B2) disclose a multiple resolution sensing apparatus comprising first and second arrays of different size photosensors elements.
- Lin et al. (US Patent No. 6,548,833 B1) disclose a color optimized CMOS pixel array wherein green pixels are smaller than red pixels.
- Fossum et al. (US Patent No. 6,137,100) disclose an active sensor pixel wherein green pixels are smaller than blue pixels.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WANDA M. NEGRON whose telephone number is (571) 270-1129. The examiner can normally be reached on Mon-Fri 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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June 10, 2008

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